many of the activities are very specific and very intricate, yet there can be no help from parental instruction. "In the vast majority of species the parent is dead long before the daughter comes to that stage of existence when the necessity for making provision for her progeny arises, so the knowledge has to pass by way of transmitted memory. Somewhere in the minute speck of protoplasm constituting the egg of one of the solitary bees there is an infinitesimal particle of nerve matter which contains the secret of how to cut accurate circles and ovals of rose-leaf so that a number of them will overlap and curve into a perfect cylinder. During the greater part of its life the creature that hatches out from that egg will have no need of the secret, but the germ of it will go on developing, and when the insect has attained to the complete bee form there is the idea in the memory cells ready to instruct the nerves that govern the action of wings and legs and cutting jaws." We have quoted this at length, for it expresses Mr. Step's view of the big riddle that lies behind his book. Unfortunately, we do not know how the secret is kept in the egg before there is any particle of nerve matter, or how the insects get the knowledge which forms the contents of the transmitted memory, or whether they really have an idea which instructs the nerves. But the author usually chooses the wise path of keeping to the facts, and gives us a charming account of spinners and weavers, miners and masons, carpenters and wood-workers, upholsterers, wax-workers, paper-makers, tailors, horticulturists, sanitary officers, musicians, burglars, and lamp-bearers. The book is fresh and competent, and the illustrations (two of which are here reproduced) deserve high praise, both the photographs by the author and the drawings by Mr. Carreras.

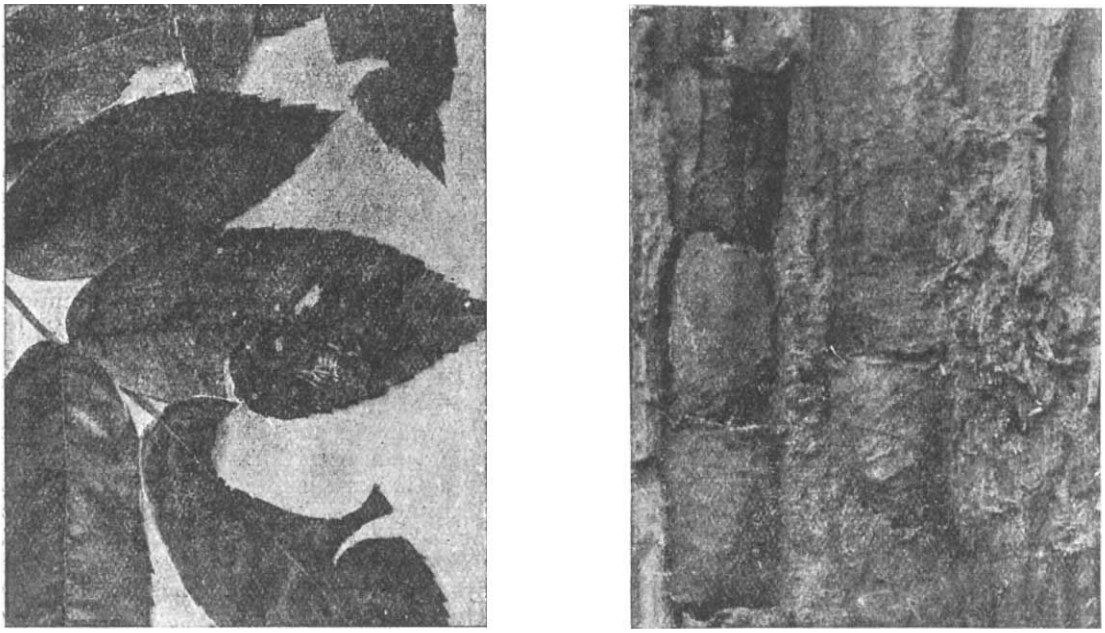

FIG. 1.—Leaf-cutter Bee. The left photo shows the bee at work. The right photo is a section of an old post and shows the thimble-shaped cells made from the cut portions of leaves. From "Insect Artizans and their Work."

(3) Mr. Robson's little book attempts the impossible, and does not succeed. The space is, indeed, inadequate for an interesting account of the inhabitants of the seashore, but it might have been used more skilfully; the illustrations are not very happy; there are several inaccuracies in the brief text; and there are far too many misprints. Several excellent inexpensive guides to the seashore, as much within children's compass as this book is, are readily available.

---

## THE RECONSTRUCTION OF THE FISHING INDUSTRY.

IN November of last year the National Sea Fisheries Protection Association made proposals for a unification of fishery administration, and it embodied these in a "Memorandum" (which was referred to in NATURE of November 28, 1918, p. 248). The memorandum was submitted to Mr. Prothero, who doubtless acquainted the Cabinet with its provisions, but that was all that happened. Eight months afterwards the Government introduced a Bill for the establishment of a Standing Fishery Advisory Committee, and for the removal of the statutory limitation of the salary of the President of the Board of Agriculture and Fisheries!

The 1918 memorandum recommended the creation of a United Kingdom Ministry of Fisheries, but its authors found that they were "up against" the opposition of the Scottish industry. So when a special joint committee of the association prepared a scheme for fishery research, statistics, education, and propaganda they took care to avoid this and other obstacles. They recognised that the only logical way of co-ordinating all British agencies for fishery development was by the setting-up of an Imperial authority; but they also recognised that this ideal was unattainable. Some other statutory body for the co-ordination of research and education would have been agreed upon by the various sections of the British industry, but the committee then found that the fishery Departments were "unlikely to acquiesce in the formation of any central authority other than a Ministry of Fisheries, to be superimposed upon them from without." In the face of *this* formidable opposition the committee had to do the "next best," and, abandoning any really comprehensive way of making use, to the greatest advantage, of all fishery workers, they have made a compromise that may be practicable. In order that as few people as possible may object, they do not recommend the formation of anything in the way of a "Super-Department." Assuming that the existing fishery authorities are to be properly financed and organised as permanent secretariats, and that each of them will then proceed to set up a scientific branch with a director of scientific work, they propose that the three permanent secretaries shall then sit as a joint research board, with such official and non-official assessors as they may nominate. The hope (uncoloured by conviction) is then expressed that the assessors may form the means of communication between the officials, the industry, and the non-official investigators.

The joint research board, so constituted, is not to be, in general, an executive body controlling research. Obviously not, for agreement could not be obtained on points of difference between officials, and departmental privilege would be too great a factor. It is to deliberate on schemes of research and transmit plans and estimates prepared by the departments. But it is recommended that it shall control the collection of fishery statistics, set up a joint editorial board which will publish all results—administrative, statistical, and scientific—in uniform style and with promptitude, and establish and carry on (through an editorial staff) a Fisheries Journal which will be, in the main, popular in character. A strong plea is made for some reform in the manner of publication, for speedy production, for some relief from the exceeding dulness and clumsiness of governmental Blue Books, and for a "break away" from the methods of H.M. Stationery Office.

Considering the things to be investigated, the Committee recognise five categories of research, and set these out in detail: (1) Practical administrative problems to be studied by the departmental staffs; (2) fish culture; (3) industrial research; (4) speculative research; and (5) oceanography. Fish culture is obviously work for the departments, and, since the fishing industry does not seem likely to undertake industrial research itself, this must be done by the Government. Speculative research—a very large category of investigations—ought to be relegated to the universities and marine biological stations, with some other subjects included in the category of industrial research and in that of oceanography. Since the departments must possess and equip sea-going vessels for their practical administrative investigations, it is obvious that they should also carry out the oceanographic observations at sea, but the working up of these should be done by the unofficial State-aided institutions. And so, it is hoped, everybody will be satisfied, and the best use possible made of all the talents.

A provisional scheme for fishery education, training, and propaganda is appended. This includes the training of administrative and scientific officers, and of men occupying responsible industrial posts, by the provision of Government fellowships tenable as post-graduate studentships at the universities; fishery colleges at Liverpool and Aberdeen; fishermen's classes carried on locally and a scheme of fishery apprenticeship. The latter proposals are most interesting. Immediately upon the outbreak of war hundreds of vessels and thousands of men were placed at the disposal of the Admiralty, and, without any special training, the duties of mine-sweeping, patrolling, and escorting were carried out in such a way as to earn loud expressions of admiration and gratitude. There were exceptional losses due to war risks and natural decrease; the training of lads largely ceased during the period of war; the old system of apprenticeship has become obsolete and, in view of naval defence and in the interest of the industry itself, a better class of lad is now desirable. The interesting suggestion is made that a number of the trawl-vessels built during the war by the Admiralty be detailed and equipped as training-vessels, and a scheme of apprenticeship is recommended.

This scheme was worked out in detail by the industry as soon as it was seen that peace was assured. It is an integral part of any attempt at fishery reconstruction and naval defence. It was submitted to the Government nearly a year ago, and it has been "under consideration" ever since then! Meanwhile the Admiralty trawlers are being offered for sale.

### SUMMARY OF MAIN RECOMMENDATIONS.

(1) That the Government be requested to provide funds for a comprehensive scheme of research statistics for the fisheries of the United Kingdom on the lines set forth in this report.

(2) That each Fishery Department be provided with a suitable scientific staff under a scientific director with well-equipped laboratories, and with sufficient steamers for research work and for the exploration of our fishing grounds.

(3) That the Fishery Departments be requested to adopt the best means they can devise for securing the uniformity of fishery statistics, and the co-ordination of research work throughout the United Kingdom.

(4) That the Fishery Departments make suitable provision for the publication of scientific reports which

are of importance to the industry, and in particular for the publication monthly of a fishery journal containing all information in regard to scientific results, statistics, statutes, orders, foreign intelligence, commercial information, and all other information likely to be of benefit to those carrying on the industry.

(5) That the Fishery Departments and the Education Departments of the three kingdoms be requested to co-operate in providing a scheme of education on the general lines laid down in the report.

## *NOTES.*

THE British Association, as an outcome of the comprehensive review of scientific work during the war, which formed a conspicuous part of the programme of the recent meeting in Bournemouth, has addressed the following resolution to the Prime Minister and the Treasury:—"The British Association for the Advancement of Science, in reviewing the results of scientific method applied to military and other practical arts, recognises that the successful issue of the war has sprung from the efforts of scientific men concentrated on those problems, and with the conviction that the well-being and security of the nation are dependent on the continuous study of such matters, would urge on H.M. Government the necessity for apportioning an adequate sum from that allocated to home administration and the upkeep of the fighting forces for the purpose of a definitely organised scheme of research, as, for example, on problems connected with health, food, and commerce, on explosives, on chemical warfare, and on physical and engineering problems bearing on military work." Similar resolutions, in varying terms according to the special cases, have been forwarded to the First Lord of the Admiralty, the Secretary for War, the President of the Board of Trade, and the Ministers of Health and Food.

THE appointment, as recently announced, of Prof. S. J. Chapman to be joint Permanent Secretary of the Board of Trade, owing to the transfer of Sir William Marwood to the Ministry of Transport, will be welcomed by all who know him. Prof. Chapman, who had held the professorship of political economy at Owens College, Manchester, since 1901, acted during the war as head of the temporary Industrial (War Inquiries) Branch of the Board of Trade, and in 1918 was appointed head of a new General Economic Department created for the purpose of assisting the Permanent Secretary in relation to questions involving economic policy. He is a fellow and member of council of the Royal Statistical Society, to the Journal of which, and to that of the Manchester Statistical Society, he has made numerous contributions bearing mainly on the cotton industry of Lancashire.

IN the *Times* of October 11 is a letter from Prof. J. Johnstone on the subject of the extension of territorial waters in relation to deep-sea fishing. It is pointed out that the information at present available is not sufficient to enable satisfactory regulations to be drafted, and that, therefore, administrative authorities should not be given legislative powers which they cannot exercise properly. Prof. Johnstone also states that scientific investigation of our sea fisheries has never been properly organised and supported, and is in a worse condition now than it ever was. We agree with him that fishery investigations in this country have been quite inadequate, and we hope in the near future to see the establishment of an organisation for the comprehensive scientific study of the sea, so important for a great maritime nation, on a scale proportionate to the magnitude of our interests.

CHANGES in the Meteorological Office staff have recently been made, and the following appointments have been announced:—Mr. R. G. K. Lempfert becomes assistant director, and takes general oversight of observations and stations contributing observations to the Office. Mr. Lempfert entered the Meteorological Office in 1902, and has been superintendent of the Forecast Division since 1910. Lt.-Col. E. Gold becomes assistant director, in charge of forecasting. Col. Gold graduated as Third Wrangler in 1902, and was elected Fellow of St. John's College, Cambridge, in 1906; he was Schuster reader in dynamical meteorology from 1907 to 1910, and he then became superintendent of statistics at the Meteorological Office. On the formation of the meteorological section of the Royal Engineers in 1915 he was appointed to the command of the overseas contingent at G.H.Q., France. Capt. D. Brunt is made superintendent of the work for Army services. Capt. Brunt was in the meteorological section of the Royal Engineers during the war, and acted under Col. Gold. Mr. Carle Salter becomes superintendent on the staff of the Meteorological Office for the British Rainfall Organisation. Mr. Salter has recently been assistant director of the British Rainfall Organisation, which has now come under the control of the Meteorological Office.

IN connection with the International Meteorological Committee, appointed by the International Conference at Innsbruck, 1905, a meeting of available members was held at the Meteorological Office, London, on July 3–9 last, and a copy of the minutes which have been printed has reached us. Since 1905 the committee has met in Paris (1907), Berlin (1910), and Rome (1913). The July meeting was of a semi-official character, and was really to prepare the way for the Paris meeting, which commenced on September 30. The president, Sir Napier Shaw, in his introductory statement directed attention to the changes caused by the great war, and especially to the new meteorological organisations developed. It was felt that the extent and detail of international co-operation must be much greater in the future than it had been in the past, but the problems are essentially of the same nature as formerly. The great development of aviation has introduced new requirements in respect of information concerning the upper air obtained by pilot-balloons or in other ways. The hours of observation for Europe were considered; 1h., 7h., 13h., and 18h. have become general, but it has been suggested that preference might perhaps be given to 3h., 9h., 15h., and 21h. Consideration was given to North Polar investigation in co-operation with Amundsen's expedition, and there was a proposal for the establishment of a meteorological station in the Island of Jan Mayen for observations from the summer of 1920 to the autumn of 1922. Necessarily much attention was devoted to the coding of messages and to the method and nature of the observations.

THE Harveian Oration will be delivered at the Royal College of Physicians by Dr. Raymond Crawfurd on Saturday, October 18, at 4 p.m.

WE regret to record that *Engineering* has suffered a severe loss in the death of Mr. B. Alfred Raworth, who had long been a member of the staff, and taken a prominent position in the editorial management during the past thirteen years. Mr. Raworth was a trained engineer, and had considerable experience prior to joining the staff of *Engineering* in 1882. He was a member of the Institution of Mechanical Engineers, of the Iron and Steel Institute, and of the Institute of Metals.